

OHIO RIVER, ILLINOIS.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT OF
EXAMINATION OF OHIO RIVER FROM MOUND CITY TO CAIRO,
ILL.

JANUARY 4, 1904.—Referred to the Committee on Rivers and Harbors and ordered to
be printed.

WAR DEPARTMENT,
Washington, December 30, 1903.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated December 24, 1903, together with copy of a report from Col. G. J. Lydecker, Corps of Engineers, dated December 7, 1903, of a preliminary examination of Ohio River, Illinois, made by him in compliance with the provisions of the river and harbor act of June 13, 1902.

Very respectfully,

ELIHU ROOT,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 24, 1903.

SIR: I have the honor to submit herewith for transmission to Congress a report dated December 7, 1903, by Col. G. J. Lydecker, Corps of Engineers, on preliminary examination authorized by the river and harbor act approved June 13, 1902, of Ohio River from Mound City to Cairo, Ill., "with a view to ascertaining what improvement, if any, is desirable for the protection of the banks and levees on the Illinois side in the interest of navigation."

In accordance with the provisions of section 14 of the act, the report has been considered by the Board of Engineers for Rivers and Harbors provided for in section 3 of said act, and its report is contained in third indorsement thereon.

After giving the subject careful consideration Colonel Lydecker expresses the opinion, based upon the facts and reasons presented in his report, that the interests of navigation do not now require the protection of the banks or levees along the river as contemplated in the act, and this opinion is concurred in by the Board and by me.

Very respectfully, your obedient servant,

G. L. GILLESPIE,

Brig. Gen., Chief of Engineers, U. S. Army.

Hon. ELIHU ROOT,

Secretary of War.

PRELIMINARY EXAMINATION OF OHIO RIVER FROM MOUND CITY TO
CAIRO, ILL.

UNITED STATES ENGINEER OFFICE,
Cincinnati, Ohio, December 7, 1903.

GENERAL: I have the honor to submit the following report on a preliminary examination of the "Ohio River from Mound City, Ill., to Cairo, Ill., with a view to ascertaining what improvement, if any, is desirable for the protection of the banks and levees on the Illinois side in the interest of navigation," as required by the river and harbor act of June 13, 1902, the duty of making this examination having been assigned to me by Department letter of June 23, 1902.

A report on this same question was made by Maj. W. H. Bixby, Corps of Engineers, October 3, 1899, to comply with the river and harbor act of March 3, 1899, which was published as House Document No. 137, Fifty-sixth Congress, first session. But a republication of a large part of it is believed to be most appropriate in connection with this paper, as the facts and considerations then presented apply with equal force at present; the following extract is therefore submitted:

Mound City, Pulaski County, Ill., is situated on the west side of the Ohio River, about 8 miles above its mouth and about 4 miles above Cairo, Ill. Mound City is a place having in 1890 a population of about 2,500 inhabitants and to-day perhaps double that number. It is a regular stopping place for all Ohio River packets descending the river. It has several manufactories along the river bank and a large marine railway for the construction and repair of river boats. It is a place of moderate commercial importance at present, but with a good prospect of large future development. Mound City itself is surrounded by a very good levee rising to above the highest water yet known at this place, and this levee extends down the river bank almost to Cache River. At Mound City the Illinois bank is building out rather than cutting away, and there is as yet no indication of the necessity of any special new protection to the levees.

Cairo, Alexander County, Ill., with its center about 6 miles below Mound City, lies at the mouth of the Ohio River and between it and the Mississippi River; the city proper being about 4 miles in length, with a breadth of about 1 to 1½ miles at its center and widest points, and with its center about 2 miles above the junction of the two rivers. Cairo had in 1890 a population of about 10,000 inhabitants and is at present perhaps twice as large. It is a regular stopping place for all Ohio River and Mississippi packets on their way downstream; is one of the most important towns in southern Illinois, especially as a distributing center for the adjoining portions of Illinois, Kentucky, and Missouri, and while of late years not growing as rapidly as some of the other towns of the State, has a good prospect of a much greater and much more rapid increase in commercial importance in the near future. Three railroads enter the city directly, and two others are connected to it by ferry transfers.

A considerable part of the city proper and almost all of its harbor front, both on the Ohio and the Mississippi, and much land outside are under the control of the so-called Cairo Trust, a private corporation which succeeded the Cairo City and Canal

Company some time in the neighborhood of 1850. The city is entirely surrounded by a fine levee rising to the 55-foot level (about 2 feet higher than the highest floods known up to the present time), so that the city itself is amply protected against all danger from damage by overflows or by cutting of the banks from either the Ohio River or the Mississippi River. There is at present no indication of undue scour along the city front on its Ohio River side, so that nothing is specially needed at this point in the way of protection for its banks or levees.

The Illinois bank from the lower end of Mound City to the upper end of Cairo, about 4 miles in length, is the portion of the bank evidently referred to in the act of March 3, 1899, as that to be examined with a view to protection or improvement. The upper mile of this stretch of river bank covers a distance from Mound City down to Cache River, Cache River being a large slough which drains an area of perhaps 400 or 500 square miles, lying just above Cairo in the angle between the Ohio and Mississippi rivers. The Cache River basin reaches so near the eastern bank of the Mississippi River a few miles above Cairo that in recent years it has been thought desirable to strengthen the Mississippi River embankment a few miles above Cairo to prevent the Mississippi River from possibly cutting through this embankment into the Cache River basin and thence into the Ohio River in such way as to form a cut-off in the Mississippi River above and around Cairo, but such protection work concerns the Mississippi River and not the Ohio, and such work, if done, must be done on the Mississippi side. There is at present no indication of any danger that the Ohio River will enter the Cache River basin and cut through the Mississippi River banks into the Mississippi River. No protection or strengthening of the Ohio banks from Mound City down to the mouth of Cache River would be of any special value in keeping the Ohio River out of the Cache River basin, and a total closure of the Cache River mouth would be impracticable.

From the mouth of the Cache River down to the upper end of the city of Cairo, a distance of about 3 miles, the river bank is concave in shape, is washed directly by the Ohio River channel currents, and is gradually wearing away in such manner as to deepen the concavity. Maps, old and new, of this part of the river show that the general shape of the river bank between Mound City and Cairo is not now much different from what it was in 1810, but that the river bank has, however, worn back steadily ever since that date.

Prior to 1880 the cutting of the bank along this 3 miles of river was very slight, amounting from 1810 to 1880—that is, during seventy years—as shown by the Coast Survey maps of 1880, to a total recession of only about 140 feet in all, or an average of only about 2 feet per year. During this interval there were apparently no levees on the Illinois bank between Mound City and Cairo, and during high freshets the river, as soon as it rose above a 30-foot stage, could overflow its banks along this whole 3-mile length and expand readily into the whole of what is now known as the "Cairo Trust drainage district," and also into the whole Cache River basin. This freedom of expansion must necessarily have reduced very greatly the flow of water in the main river and slackened its current, and may have accounted very greatly for the slow cutting of the bank. Some time after 1880, however, the Cairo and Vincennes Railroad converted its railroad track, then distant only about 600 feet at the most from the river bank, into a high embankment rising to above the highest freshets; and about the same time the Cairo Trust built a levee of its own along the north side of its property on the Cache River front, thus shutting off this natural overflow of the Ohio River at high stages and preventing its entrance into the Cache River basin except through the narrow mouth of the Cache.

From 1873 to 1889 the cutting of the banks was much greater than before, commencing just below Mound City and above the mouth of the Cache, extending down almost to the upper end of Cairo, and amounting, in some places, to a recession of about 300 feet, or an average of 20 feet per year. The construction of this railroad embankment so near the river bank is undoubtedly responsible for some of the increased erosion of this stretch of bank. It is possible that this increased erosion may have been anticipated or feared by the Cairo Trust owners, as in giving to the railroad companies a right of way through their property the trust company bound the railroad companies to maintain permanent levees along such rights of way next the river bank, by which they provided for the permanent protection of their trust properties. Any parties building such levees alongside of a large river like the Ohio should expect and prepare for a possible increased erosion of the banks, and should, for the protection of their own properties, arrange for a riprap or other protection of such banks in case the increased erosion actually occurs.

The cost of such protection, however, is clearly something in which the public at large is not specially interested, and for which it should not be expected to pay. From 1889 to 1897 the maximum recession was about 130 feet, or about 16 feet per year; but since then the cutting has increased much more rapidly, the rate between 1897 and 1899, in the worst places, amounting to a total of 100 feet, or an average of

50 feet per year. Even this cutting, however, can go on for ten to twenty more years before in any way seriously interfering with the Ohio River navigation or with the commercial interests of Mound City or Cairo, but of course not without serious injury to the private riparian properties on which the cutting occurs.

In about 1893, at the request of those interested in the navigation of this part of the Ohio River, the Government commenced the improvement of the bar opposite Mound City for low-water use by steamboats and barges, doing this by dredging in the deepest part of the river near the Illinois side, and by building a low dike half-way across the river from the Kentucky side. As the dike was very low, rising to not more than 4 feet above low water, and as the dredged channel was narrow and has not as yet, even with the aid of the dike, increased the channel depth more than 3 feet, and as the serious cutting and caving of the river bank below the dike is only produced during river stages of from 30 to 50 feet depths, the low diking and shallow dredging so far done by the Government become insignificant at bank-cutting stages, and so can hardly be held responsible for the recent rapid cutting below Mound City since 1893, and certainly not for the great increase in cutting previously evident between 1873 and 1889.

A more probable reason for the more rapid caving of this bank within recent years is that the portions of the bank now exposed to river action show evidence of a stratum of fine sand, in some cases 3 feet in thickness, underlying the natural surface of the drainage district property at a distance of about 18 feet below the surface of that property, and so at a distance of only about 12 feet above low-water level. When the river rises to stages of 30 feet and upward, the exposed face of this sand stratum easily washes out into the river, and the bank above it then naturally falls of its own weight and slides off into the river, where it is easily washed away by the natural current of the river.

Although this recession of banks is quite extensive, it is hardly any more so than at many other places along the Ohio River above Mound City. The Ohio River has already hundreds of miles of caving banks, whose proper protection would probably cost over \$20,000,000. Such protection, however, seems at present secondary to the removal of the existing river bars, the latter work needing all the funds that can be spared by the United States for several years to come. Until the United States is prepared to assume the protection and repair of all the caving banks along the entire length of the Ohio River, and their ownership, it would seem to me that all such work should be done by and at the expense of the private parties who are directly interested, and who benefit by the riparian rights, and should not be done at the expense of the General Government.

The land between the river and the Cairo and Vincennes Railroad, as well as that in rear of this railroad along the 3-mile length of river bank from Cache River to Cairo, is almost all under the ownership or control of the Cairo Trust. Some of the recent descriptions circulated by this trust claim in this area an ownership of 7,000 acres of excellent land, some of which is reported to have produced over \$1,000 worth of crops in one year. This tract of land lies at a general elevation of about 30 feet above low water, so that without protection of some sort it would always be covered by winter freshets. The mass of this property is, however, protected on its south side by the Cairo city levee; on its east side from the Ohio River floods by the levee of the Cairo and Vincennes Railroad; on the west side from the Mississippi River floods by the levee of the Mobile and Ohio Railroad; and on its north side next the Cache River by the Cairo Trust's own levee; while east of its center, and at least one-half mile back from the Ohio River bank, this protection is reenforced by the levee of the Illinois Central Railroad.

This tract of land, with a 3-mile frontage on the Ohio River and a slightly greater frontage on the Mississippi River, and lying between the Cairo city proper and the Cache River basin, goes by the name of the "drainage district," belongs almost all to the Cairo Trust, and is given up almost entirely to agricultural purposes, there being no city or town properly so called within its limits. The railroad levees through this property rise to a level of about 55 feet, so that they thoroughly protect the district from overflow. Should the wear of the banks continue at its present rate for two or three years more, the Cairo Trust, for the protection of its 7,000 acres of drainage district lands, or the Cairo and Vincennes Railroad, for the protection of its own line of track, as well as for the protection of the Cairo Trust drainage district in its rear under the terms of its rights of way, or both, will be obliged to protect their river fronts against further erosion, or else will have to move back as the river advances.

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My various examinations show, therefore, that between Mound City and Cairo, along the stretch of river referred to in the act above named, there is no special caving of the banks at all unusual for the Ohio River, and none greater than at many

other places in the river above; that such caving is not extensive enough to seriously affect at present the navigation of the Ohio River, nor would it do so if the caving should continue without interruption for many years to come; that the protection of this bank is not essential either to Mound City or to Cairo and can have no decided effect on the commerce of either place, and that the only large special interests involved at the present time or for the next few years are those of the private properties of the Cairo and Vincennes Railroad and the Cairo Trust Company, and not that of the general public.

I have therefore to report that in my opinion the improvement of the Ohio River bank from Mound City to Cairo is not at present necessary to the interests of navigation, and is not at present worthy of being undertaken by the General Government.

The examination called for by the river and harbor act of June 13, 1902, was made with great care in November and December, 1902, by Assistant Engineer J. N. Caldwell, who was during that period in charge of a field party engaged in miscellaneous surveys on the lower portions of the river. The result of it was to show that the general conditions remain essentially as described in the foregoing extract from Major Bixby's report of his examination in 1899. The bank erosion referred to in that report has continued along the bend on the Illinois side, between Mound City and Cairo, but the top of the bank was still found to be from 90 to 275 feet in advance of the levee or embankment on which the tracks of the Cairo and Vincennes branch of the Big Four Railroad are laid, and the outer slope of this levee is well protected by riprap. At two points where indications of undermining had become most apparent, the railroad company took measures, in 1900, to counteract such action by excavating trenches outside of the levee slope, through the permeable material, and refilling the trenches with clay. Except for the possibility of undermining at some other parts of this levee, the entire system of levees was found to be solid and substantial.

It has been suggested that the Illinois bank should be revetted or protected between Mound City and Cairo, because there is danger that the Ohio River, when in high flood, may cut through to the Mississippi, back of Cairo, to the probable injury of navigation; the distance between the two rivers at the narrowest part of the peninsula by which they are separated being only about three-fourths of a mile. This could only occur as a result of simultaneous breaches through the several substantial levees or railroad embankments that now cross the suggested line of cut-off, viz, the Big Four levee on the Ohio River bank, and the three embankments of the Illinois Central and Mobile and Ohio railroads. It is believed that such an occurrence is in the highest degree improbable, if not actually impossible; in any event the existence or nonexistence of the suggested bank protection would not be likely to have any material effect on the result in such a crisis.

It has also been contended that bank protection is needed below the mouth of the Cache River, in the interest of navigation, as continued erosion tends to make the bend in that part of the Ohio a sharper one and more difficult to navigate. The length of bank to be protected would be nearly 14,000 feet, and it is estimated that the cost of an efficient and durable method of protection would be from \$10 to \$12 per linear foot, or about \$150,000 for the distance in question. The cost would be wholly incommensurate with the resultant benefits to navigation.

A map^a is submitted herewith which shows the location of the

^aNot printed.

levees and other embankments, together with a profile across the peninsula between the Ohio and Mississippi rivers. It also indicates the central line of low-water channel in the Ohio River below Mound City, showing that the bend above referred to is quite a gentle one with a radius of about 8,400 feet.

After careful consideration of all the data supplied by Assistant Engineer Caldwell's survey and investigations, and a close personal examination of the bank and channel of the river, and of the several levees and embankments, I am of the opinion that the interests of navigation do not now require protection of the banks or levees on the Illinois side of the Ohio River between Mound City and Cairo, Ill.

Very respectfully, your obedient servant,

G. J. LYDECKER,
Colonel, Corps of Engineers.

Brig. Gen. G. L. GILLESPIE,
Chief of Engineers, U. S. A.

[First indorsement.]

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 11, 1903.

Respectfully referred to the Board of Engineers for Rivers and Harbors constituted by Special Orders, No. 24, Headquarters, Corps of Engineers, series of 1902, for consideration and recommendation.

By command of Brig. Gen. Gillespie:

W. V. JUDSON,
Captain, Corps of Engineers.

[Second indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., December 15, 1903.

Respectfully returned to the Chief of Engineers, United States Army.

The within report on a preliminary examination of "Ohio River from Mound City, Illinois, to Cairo, Illinois," has been carefully reviewed by the Board of Engineers for Rivers and Harbors.

The river and harbor act of March 3, 1899, called for a report on this same subject. This report is published in House Document 137, Fifty-sixth Congress, first session. The district officer states that the facts and considerations then presented apply with equal force at present and quotes from said report at length.

It is clearly shown within that the protection of the banks and levees between Mound City and Cairo is not necessary in the interests of navigation; that water-borne commerce would in no way be affected thereby, and that the only benefits to be expected from such improvement would inure to the Cleveland, Cincinnati, Chicago, and St. Louis Railway Company and riparian owners.

In view of these facts the Board expresses the opinion that no improvement for the protection of the banks and levees on the Illinois side of the Ohio River, between Mound City, Ill., and Cairo, Ill., is

desirable in the interests of navigation. The Board therefore believes that the United States should not undertake this improvement, and so recommends.

For the Board.

A. M. MILLER,
Lieut. Col., Corps of Engineers,
Senior Member Present.

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